

◆ Corporate Data

Name	Daiwa Exploration & Consulting Co., Ltd.
Established	1 May 1979
Capital	50 Million JPY
License	Construction Consultant (Geology / Soil and Foundations / Agricultural Civil Engineering) Geological Survey Business Surveying Work Special Construction Business — Scaffolding and Carpentry Business — Civil Engineering Business Ordinary Construction Work — Well Drilling Business ISO 9001 : 2015 ASR Q0060

◆ Office Locations

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Tohoku Office	2-5-55 Fukumuro, Miyagino-ku, Sendai-shi, Miyagi, 983-0005, Japan Tel : +81-22-258-1701 / Fax : +81-22-258-1702
Toyama Office	UPBEAT NISSIN Room #202, 639-19 Chayamachi, Toyama-shi, Toyama, 930-0115, Japan Tel : +81-76-482-4490 / Fax : +81-76-482-4491
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Yamanashi Office	1199-1 Shibokusa, Oshinomura, Minamitsuru-gun, Yamanashi, 401-0511, Japan Tel : +81-555-25-6881 / Fax : +81-555-25-6882
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Hiroshima Office	4-13-25 Nagatsuka, Asaminami-ku, Hiroshima-shi, Hiroshima, 731-0135, Japan Tel : +81-82-537-1131 / Fax : +81-82-537-1132
Fukuoka Office	TOKAN Bldg. No. 5 Room #806, 2-19-17 Hakataekimae, Hakata-ku, Fukuoka-shi, Fukuoka, 812-0011, Japan Tel : +81-92-477-5411 / Fax : +81-92-477-5412
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Okinawa Office	#2F 5-2-7 Nishihara, Urasoe-shi, Okinawa, 901-2101, Japan Tel : +81-98-874-2917 / Fax : +81-98-874-3069
Representative Office in Ho Chi Minh City	Suite55, Level 21 Vietcombank Tower, No.5 Me Linh Square Ben Nghe Ward, District 1 Ho Chi Minh City, Vietnam Tel : +84-28-3827-1927
Singapore Office	60, Kallang Pudding Road #02-00, Tan Jin Chwee Industrial Building, Singapore 349320



PLANNING

Survey Planning / Proposals

The survey of the non-visible underground and interior structures, not just the structural surface, is always essential for the construction of public facilities such as roads, harbors, airports, and dams, or for the maintenance or repair of existing infrastructure. It is important to make appropriate surveying plans suited to one's purpose and the field conditions.

As experts in the field of survey technology with years of experience and achievements, we can provide you with the optimal survey plan to survey land, sea (seabed), and structural targets.



Sensor Experiment Using Dummy Bombshell



Inspection of Bridge



Deterioration Survey of Sand Control Dam



Bomb Found by Magnetic Prospecting



SURVEYING

High-Precision Sea, Mountain,
and Land Surveying

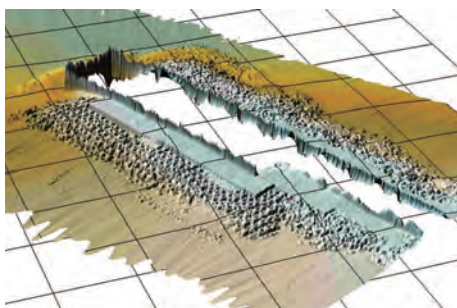
No matter how well underground information is understood, it does not help much in infrastructure development if geological features, especially their position, are not made clear by surveying. Total station and aerial surveying are mainly applied for land surveying while GNSS (Global Navigation Satellite System) is applied for offshore surveying. Echo sounder, narrow multibeam, and side scan sonar devices are used to measure the depth and topography of seabeds with GNSS as Navigation system. Through the combination of these surveys, positioning and geological information about the designated target can be made clear.



Reference Point Surveying



Multibeam Bathymetric Surveying



Seabed Image Taken by Narrow
Multibeam Surveying



Boundary Stake Installation



GNSS Surveying



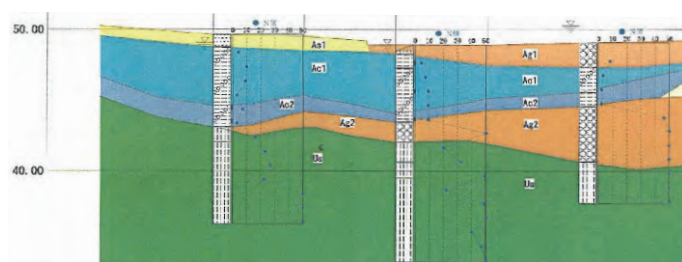
Side Scan Sonar



GEOLOGICAL SURVEYS

Examination Through
Visual Observation, Drilling, Testing, and Vibration

Geological surveys are necessary for obtaining information on the details of infrastructure design. In geological reconnaissance surveys, survey personnel walk and visually examine the distribution of geological features and ground conditions of designated areas according to existing geological and/or topographic maps. In borehole surveys, soil samples are collected to directly observe the geological features, weathering, and cracking of the soil. By testing the soil we are able to examine the physical properties of the ground. We can also perform a variety of borehole tests as well as borehole logging. Furthermore, cross-borehole information can be obtained by geophysical surveys such as Vertical Seismic Profiling (VSP).



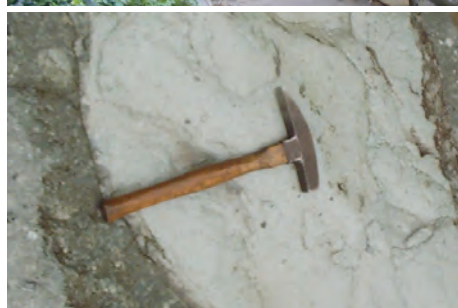
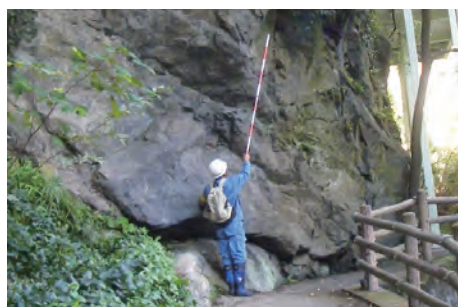
Geological Cross-section by Acoustic Survey and Columnar Section Created by Boring Survey



Marine Seismic Reflection Survey



Boring Survey



Geological Reconnaissance



Offshore Survey



GEOPHYSICAL PROSPECTINGS

Examination of Geological Properties by
Acoustics, Electricity, Gravity, and Magnetism

Geophysical Prospecting are surveys to investigate the status of underground soil using differences in the physical properties of survey targets. In geophysical prospectings, ground stiffness is evaluated by using the propagation speed of seismic or acoustic waves. In groundwater surveys, ground resistivity (electrical resistivity) is measured to estimate the spatial distribution of underground water. In magnetic prospecting, such as UXO (unexploded ordinance) detection, local magnetic anomalies are detected with high-sensitivity magnetic sensors using the ferrous properties of UXOs. The special devices used for these surveys, such as the magnetic sensors and the amplifiers for signal process, are in-house equipment designed solely by DAIWA.



Marine Magnetic Survey



Marine Seismic Reflection Survey



Borehole Logging (Measuring
Physical Properties of the Soil)



Land Seismic Reflection Survey
(Acquisition of Field Data)



Vertical Magnetic Prospecting in
Borehole



Seismic Source by Mini-Impactor for
Land Seismic Reflection Survey



Bombshell Detection by Metal
Detector



Underground Cavity and
Obstruction Survey by GPR (Ground
Penetrating Radar)



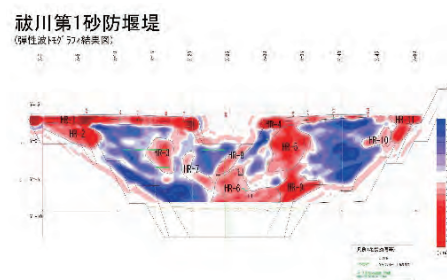
ANALYSIS / DESIGN

Data Analysis and Interpretation Using Physics, Mathematics, and Program Development

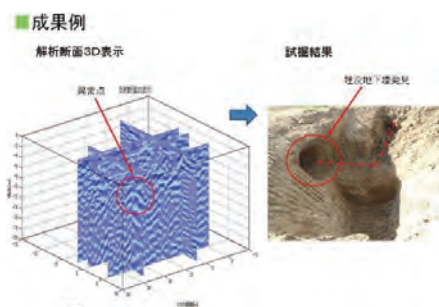
Field data undergo various steps of processing and analysis by our experts. Results are visualized as contour maps, color cross-sections, and 3D displays for ease of understanding. These informations are then interpreted from geological and geotechnical points of view and we are able to incorporate the results of these interpretations into the site plan. In this case, it is important to verify the validity of the analyses.



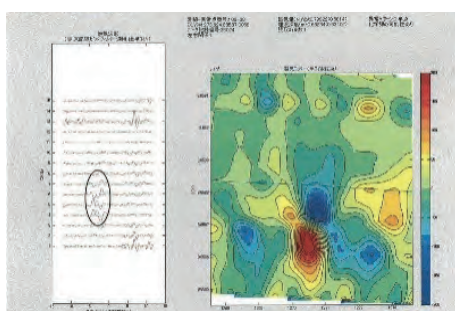
High-Density Electrical Prospecting



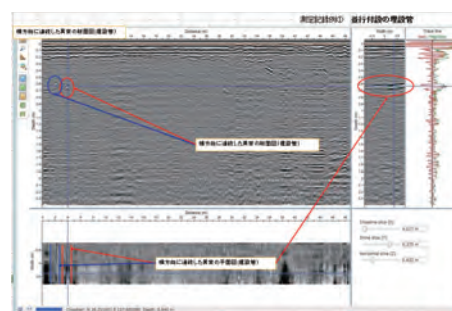
Imaging of the Deterioration of a Sand Control Dam by Seismic Tomography



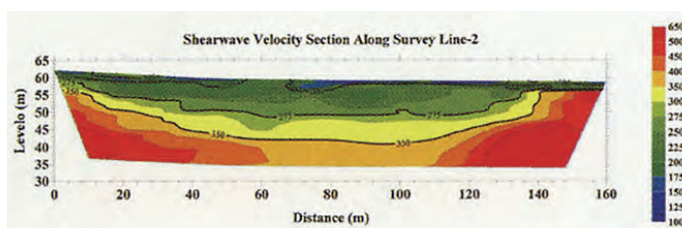
Cavity Survey by Seismic Reflection Method



High-Density Magnetic Analysis (Contour Map)



3D Radar Record (Underground Pipe)



Stratigraphic Layer Classification Diagram



CONSTRUCTION / MAINTENANCE / MANAGEMENT

The Need for the Point of View of an Expert for
Restoration & Repair

Social infrastructures that have been built up to now will face the problems of deformation and damage due to corrosion, deterioration, ground loosening, and other factors as time passes. Decades after construction, drawings and other information on underground structures (such as on pile toes and foundation types) may not be accessible or may not exist, possibly having an impact on maintenance or the construction of new structures. Geophysical prospecting is a very useful method for gathering all the necessary information. Recently, environmental surveys and the use of renewable energy have been promoted from a global environmental protection stand point. Our company in particular is striving to advance the field of geothermal heat pumps, such as in the areas of survey, design and construction.



Steel Pile Wall Thickness Survey by a Diver



Deterioration Survey of Bridge by Seismic Tomography



Survey of Cavity under Road by 3D GPR



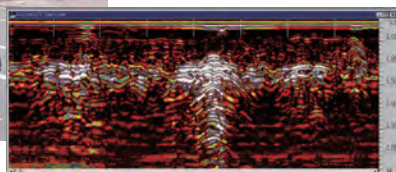
Installation of Geothermal Loop



Thermal Response Testing of Geothermal Heat Pump



GPR Survey



Sample Record (Underground Pipe)



Pile Toe Survey by Vertical Magnetic Prospecting